

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Amend claims 24 and 37, as follows.

Listing of Claims:

1 1. (Canceled)

1 2. (Previously presented) The apparatus as recited in claim 5
2 further comprising:
3 means for dynamic management of the windows.

1 3. (Previously presented) The apparatus as recited in claim 2
2 further comprising:
3 means for using historical values in present said windows to help
4 populate inserted said windows.

1 4. (Previously presented) An apparatus for monitoring time
2 series, comprising:
3 one or more registers each for storing received data points of a
4 corresponding time series;
5 means for receiving data points of one or more time series and
6 storing the received data points in the corresponding registers;
7 means for receiving query strings representing queries;
8 means for compiling the received query strings into persistent
9 queries;
10 at least one said persistent query, each defining a query
11 represented by received said query strings, each persistent query being a
12 function of the time series of corresponding one or more trigger registers
13 of the one or more registers;

14 means, responsive to storing of a received data point in a trigger
15 register, for evaluating each persistent query corresponding to the trigger
16 register; and
17 means for outputting a payload of each evaluated persistent query
18 whose event condition has a first value.

1 5. **(Previously presented)** The apparatus of claim 4 wherein:
2 at least one register comprises
3 one or more windows each for maintaining statistics for a
4 corresponding subset of the register's corresponding time series; and
5 at least one persistent query is a function of one or more windows
6 of the corresponding one or more trigger registers.

1 6. **(Previously presented)** The apparatus of claim 5 wherein:
2 each persistent query defines an event condition and a payload
3 specification of the defined query, where at least one of the event
4 condition and the payload specification is a function of the time series of
5 the corresponding one or more trigger registers.

1 7. **(Previously presented)** The apparatus of claim 6 wherein:
2 at least one of the event condition and the payload specification of
3 at least one persistent query is a function of the statistics maintained by at
4 least one window of at least one of the corresponding one or more trigger
5 registers.

1 8. **(Previously presented)** The apparatus of claim 5 comprising:
2 means for performing online computation of the statistics.

1 9. **(Previously presented)** The apparatus of claim 4 comprising:
2 means for dynamic management of persistent queries.

1 10. **(Withdrawn)** An apparatus monitoring time series, comprising:
2 means for receiving data points of one or more time series;
3 one or more registers each corresponding to a different one of the
4 time series, each register comprising
5 a buffer for storing a plurality of most-recently received data points
6 of the corresponding time series, and
7 one or more windows, each associated with a subset of the
8 register's corresponding time series, for maintaining statistics for the
9 associated subset;
10 one or more persistent queries each corresponding to one or more
11 trigger registers of the one or more registers and defining an event
12 condition and a payload specification that expresses data that are to be
13 output when the event condition evaluates to a first value;
14 means, responsive to a trigger register storing a newly-received
15 data point, for evaluating the event condition of each persistent query
16 corresponding to the trigger register; and
17 means for outputting the output data specified by the payload
18 specification of each persistent query whose event condition evaluates to
19 the first value.

1 11. **(Withdrawn)** The apparatus of claim 10 further comprising:
2 means, responsive to receipt of a data point of a time series, for
3 storing the data point in the buffer of individual said register corresponding
4 to the data point's time series; and
5 online computation means, responsive to the means for storing, for
6 updating the statistics of the windows of the individual register to account
7 for the stored data point.

1 12. **(Withdrawn)** The apparatus of claim 11 wherein:
2 the means for storing comprise
3 a register basic lock;

- 4 a register booster lock;
- 5 a window lock; and
- 6 a query lock.

1 13. **(Withdrawn)** The apparatus of claim 11 wherein:
2 at least one of the event condition and the payload specification of
3 at least some persistent queries are a function of the statistics of the
4 windows of the trigger registers of the at least some persistent queries.

1 14. **(Withdrawn)** The apparatus of claim 10 wherein:
2 the means for receiving comprise
3 an input for receiving a stream of data values each labeled to
4 indicate the time series to which the data value belongs;
5 a filter for determining from each data value's label whether the
6 data value belongs to a time series monitored by the apparatus and
7 discarding those data values that do not belong to a monitored series; and
8 a sequencer for supplying a unique identification number to each
9 filtered data value.

1 15. **(Withdrawn)** The apparatus of claim 14 further comprising:
2 means for storing the filtered data value accompanied by the
3 unique identification number and a timestamp in the buffer of the individual
4 register corresponding to the data value's time series; and
5 online computation means, responsive to the means for storing, for
6 updating the statistics of the windows of the individual register to account
7 for the stored filtered data value.

1 16. **(Withdrawn)** The apparatus of claim 10 comprising:
2 means for adding a register to the apparatus.

1 17. **(Withdrawn)** The apparatus of claim 10 comprising:

2 means for adding a window to a register of the apparatus.

1 18. **(Withdrawn)** The apparatus of claim 17 wherein:
2 the means for adding a window comprise
3 a register basic lock;
4 a register booster lock; and
5 a window lock.

1 19. **(Withdrawn)** The apparatus of claim 10 comprising:
2 means for dynamic management of persistent queries.

1 20. **(Withdrawn)** The apparatus of claim 10 further comprising:
2 an input for receiving a query;
3 a parser for parsing the query into one or more query strings
4 corresponding to the payload specification, the event condition, and the
5 one or more trigger registers; and
6 means for compiling the query strings into a persistent query.

1 21. **(Withdrawn)** The apparatus of claim 20 further comprising a
2 query lock.

1 22. **(Previously presented)** A method of monitoring time series,
2 comprising:
3 receiving query strings representing a query;
4 compiling from the received strings a persistent query defining the
5 represented query as a function of one or more time series;
6 receiving data points of the one or more time series;
7 storing the received data points each in a register for storing
8 received data points of a corresponding one of the one or more time
9 series;

10 in response to storing of a received data point in a register, using
11 contents of the register to evaluate each persistent query that is a function
12 of the register's corresponding time series; and
13 outputting a payload of each evaluated persistent query whose
14 event condition has a first value.

1 **23. (Previously presented)** The method of claim 22 wherein:
2 storing the received data points comprises
3 updating statistics of any windows of the registers that store the
4 received data points to account for the stored data points, wherein at least
5 one register comprises one or more said windows each for maintaining the
6 statistics for a corresponding subset of the register's corresponding time
7 series; and
8 using contents of the register comprises
9 using contents of at least one of the one or more windows of the
10 register to evaluate each persistent query that is a function of the
11 register's corresponding time series.

1 **24. (Currently amended)** The method of claim 23 wherein:
2 using contents at of at least one of the one or more windows
3 comprises
4 using contents of the at least one window to evaluate at least one
5 of an event condition and a payload specification of the persistent query,
6 where the at least one of the event condition and the payload specification
7 is a function of the register's corresponding time series.

1 **25. (Previously presented)** The method of claim 23 wherein:
2 updating statistics comprises
3 performing online computation of the statistics.

1 26. **(Previously presented)** The method of claim 22 further
2 comprising:
3 dynamically managing the persistent queries.

1 27. **(Previously presented)** The method of claim 23 further
2 comprising:
3 dynamically managing the windows.

1 28. **(Previously presented)** The method of claim 27 further
2 comprising:
3 using historical values in present said windows to help populate
4 inserted said windows.

1 29. **(Withdrawn)** A method of monitoring time series, comprising:
2 associating each of one or more registers with a corresponding
3 time series of one or more time series:
4 including in each said register one or more windows each
5 associated with a subset of the register's corresponding time series and
6 maintaining statistics for the associated subset;
7 forming one or more persistent queries each corresponding to one
8 or more trigger registers of the one or more registers and defining an
9 event condition and a payload specification that expresses data that are to
10 be output when the event condition evaluates to a first value;
11 receiving a data point of one of the one or more time series;
12 in response to the receiving, storing the received data point in a
13 buffer for storing a plurality of most-recently received data points of the
14 one time series, of a register that corresponds to the one data series;
15 in response to a buffer of a trigger register storing a newly-received
16 data point, evaluating the event conditions of each persistent query
17 corresponding to the trigger register; and

18 outputting the output data specified by the payload specification of
19 each persistent query whose event condition evaluates to the first value.

1 30. **(Withdrawn)** The method of claim 29 further comprising:
2 in response to the buffer of one of the registers storing the newly-
3 received data point, updating statistics of the windows of the one
4 register to account for the stored data point.

1 31. **(Withdrawn)** The method of claim 30 wherein:
2 evaluating the event conditions comprises
3 evaluating at least one of the event condition and the payload
4 specification of at least some of the persistent queries corresponding to
5 the trigger registers as a function of the statistics of the windows of the
6 trigger registers of the at least some persistent queries.

1 32. **(Withdrawn)** The method of claim 29 wherein:
2 receiving a data point comprises
3 receiving a stream of data values each labeled to indicate the time
4 series to which the data value belongs;
5 determining from each data value's label whether the data value
6 belongs to a time series monitored by the method and discarding those
7 data values that do not belong to a monitored series; and
8 supplying a unique identification number to each data value that is
9 not discarded.

1 33. **(Withdrawn)** The method of claim 32 further comprising:
2 storing the not-discarded data value accompanied by the unique
3 identification number and a timestamp in the buffer of the register
4 corresponding to the data value's time series; and

5 in response to the storing, performing online computation to update
6 the statistics of the windows of the register to account for the stored data
7 value.

1 34. **(Withdrawn)** The method of claim 29 comprising:
2 adding a register to the one or more registers.

1 35. **(Withdrawn)** The method of claim 29 comprising:
2 adding a window to a register to the one or more registers.

1 36. **(Withdrawn)** The method of claim 29 comprising:
2 dynamically managing persistent queries.

1 37. **(Withdrawn)** The method of claim 29 wherein:
2 forming one or more persistent queries comprises
3 receiving a query;
4 parsing the query into one or more query strings corresponding to
5 the payload specification, the event condition, and the one or more trigger
6 registers; and
7 compiling the query strings into a persistent query.